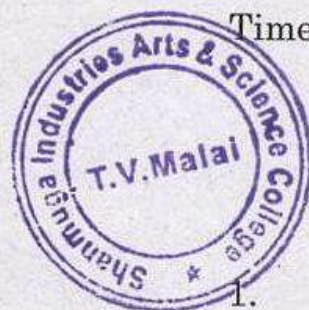


NOVEMBER/DECEMBER 2025

23UBC41 — BIOCHEMICAL TECHNIQUES



Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is the Henderson-Hasselbalch equation?
2. Define the Svedberg constant (S unit).
3. Difference between adsorption and partition chromatography.
4. Define affinity chromatography.
5. What is Tiselius moving boundary electrophoresis?
6. Mention any two differences between agarose gel electrophoresis and SDS-PAGE.
7. What is the basic principle of colorimetry?
8. Define wave number.

9. What is the half-life of a radioactive substance?

10. Define radioactivity.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Discuss the role of buffers in biological systems with relevant examples.

Or

(b) Describe the measurement of pH using a pH meter.

12. (a) How does ion-exchange chromatography help in protein purification?

Or

(b) Describe the working mechanism of gel permeation chromatography.

13. (a) Explain the general principles of electrophoresis and its procedure.

Or

(b) What are the factors affecting electrophoretic mobility?

14. (a) Explain Beer Lambert's law.

Or

(b) Discuss the instrumentation of a colorimeter and its applications.

15. (a) Explain the three types of radioactive decay with examples.

Or

(b) Describe the working principle of a Geiger-Müller (GM) Counter.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain differential centrifugation and density gradient centrifugation. How are they used in biological research?

17. Explain the principle, instrumentation, and applications of thin-layer chromatography.

18. Discuss the principle, instrumentation, of SDS-PAGE.

19. Explain the principle, instrumentation, and applications of UV-visible spectrophotometry.

20. Discuss the biological applications of radioisotopes and the safety measures required for handling them.

